

U.S. Serial No. 09/977,047 -- 4

#### REMARKS

Claims 1-9 remain in the application. Claim 1 has been amended to recite that the stator winding is a 5-phase winding without any other winding and that the opposed pole members define rotor pole pairs. Claim 3 has been amended to recite rotor pole pairs. Claim 8 has been amended to recite zero sequence current from the neutral tie of a star connection configuration arrangement of the windings and claim 9 to recite short pitch wind, around fewer stator teeth, of the wire. With these amendments applicants submit that the claims comply with 35 USC 112.

Claims 1-9 were rejected under 35 USC 103 as being unpatentable over Auinger et al. in view of Stroppa et al. The action states that Auinger et al. comprises a stator assembly having a 5-phase winding and that one skilled in the art would put the 5-phase stator of Auinger et al. in the casing disclosed in Stroppa et al. to obtain applicants' invention. Applicants respectfully traverse this rejection and any rejection based on Auinger et al. or Stroppa et al.

Applicants' invention is a 5-phase generator. The object of applicants' invention is to significantly reduce the magnetic noise associated with 3-phase generators and dual 3-phase generators. Applicants have accomplished this objective by configuring a unique winding pattern for five windings around a stator assembly. Applicants have amended claim 1 to recite "a 5-phase winding without any other winding distributed through and among said stator teeth."

The Auinger et al. reference is a 3-phase machine and not a 5-phase machine. Therefore Auinger et al. has the magnetic noise problems inherent in 3-phase machines. Auinger et al. does include field excitation provided by a separate auxiliary stator winding. However, Auinger et al. does not teach or suggest anything more than a 3-phase machine.

Stroppa et al. discloses another generator with a separate auxiliary winding for excitation. Herein the auxiliary winding is a fractional slot winding. Applicants' invention is not a machine of this type, does not contain an auxiliary winding, and is not fractional slot wound.

U.S. Serial No. 09/977,047 -- 5

Any combination of Auinger et al. and Stroppa et al. would not provide a fundamental 5-phase machine and would not provide the advantage of reducing the magnetic noise associated with 3-phase and dual 3-phase machines. Therefore applicants submit that amended claim 1 patentability distinguishes over these references.

Claims 2-9 depend directly or indirectly from amended claim 1 and include all the limitations therein. It is therefore respectfully submitted that claims 2-9 are also allowable.

This Amendment is believed to be fully responsive to the issues raised in the Office Action and to place this case in condition for allowance. Favorable action is requested.

Respectfully submitted,

By \_\_\_\_\_  
Margaret A. Dobrowitsky, Attorney  
Reg. No. 36,501  
(248) 813-1250

U.S. Serial No. 09/977,047 -- 6

## AMENDMENTS

### Version with markings to show changes made

#### In The Specification:

Substitute the following for the paragraph beginning on page 4, line 20.

In a generic embodiment of the invention illustrated in FIG. 4, a 5-phase stator winding 46 is wound onto 60 slot/tooth ring 40 by winding an enameled copper wire 48 beginning at S1 and winding around five stator teeth 44, then advancing 5 stator teeth and winding around the next five stator teeth and repeating this pattern until all the stator teeth are wound, completing one phase, and the wire is brought out at F1. A second phase of the 5-phase windings is similarly wound beginning at S2 which is two stator slots advanced from the beginning winding of the first set of 5-phase windings, S1, finishing at F2. A third phase of the 5-phase winding is similarly wound beginning at S3 which is two stator slots advanced from the beginning winding of the second set [a] of 5-phase windings, S2, finishing at F3. A fourth phase of the 5-phase winding is similarly wound beginning at S4 which is two stator slots 42 advanced from the beginning winding of the third set [a] of 5-phase windings, S3, finishing at F4. And a fifth phase of the 5-phase winding is similarly wound beginning at S5 which is two stator slots 42 advanced from the beginning winding of the fourth set [a] of 5-phase windings, S4, finishing at F5.

#### In The Claims:

Amend claims 1, 3, 7, 8 and 9 as follows:

1. (Amended) An alternating current (AC) generator comprising:  
a casing defining an accommodation space therein;  
a stator assembly supported in said accommodation space in said casing;  
said stator assembly including stator slots/teeth and a 5-phase winding  
without any other winding distributed through and among said stator teeth;

U.S. Serial No. 09/977,047 -- 7

a rotor assembly including a plurality of pairs of opposed pole members,  
defining rotor pole pairs, rotatably disposed inside said stator assembly;

said pairs of pole members configured for energization in opposite  
magnetic polarity; and

a plurality of rectifiers to rectify output voltages generated by the 5-phase  
winding.

3. (Amended) The AC generator of claim 1 wherein said stator slots  
number 10 times the number of rotor pole pairs.

7. (Amended) The AC generator of claim 4 wherein each phase winding  
of the [five,] 5-phase windings is offset two stator teeth from the adjacent phase winding.

8. (Amended) The AC generator of claim 1 including a diode pair to  
capture zero sequence current from the neutral tie of a star connector configuration  
arrangement of the windings.

9. (Amended) The AC generator of claim 1 wherein the stator is wound  
with a short pitch wind, around fewer stator teeth, of the wire.